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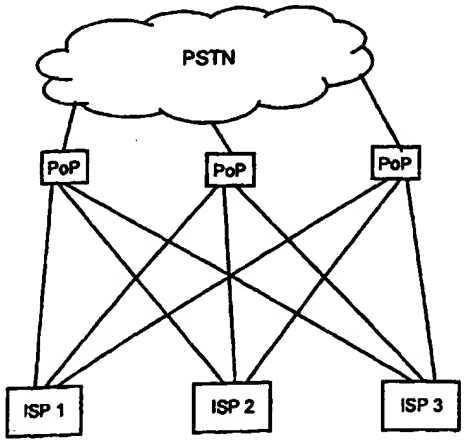
(54) Title: SYSTEM FOR COUPLING THE PUBLIC TELEPHONE NETWORK TO THE INTERNET

(57) Abstract

System for coupling the public telephone network to the Internet using a number of Points-of-Presence, or PoPs, arranged between the public telephone network or Public Switched Telephony Network PSTN, and an Internet Service Provider, or ISP. A Public Switched Packet Data Network is arranged between a number of PoPs and a number of ISPs in such a way that a signal received by a PoP can be switched through to more than one ISP. The PoP can be chosen from the public telephone network – PSTN – using various numbers, in which the selected number determines which ISP is contacted through the PSPDN. The PSPDN for applying the system is executed such, that it is able to switch a signal received from an arbitrary PoP to one specific ISP.



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System for coupling the public telephone network to the Internet.

The invention relates to a system for coupling the public telephone network to the Internet using a number of Points-of-Presence, or PoPs, arranged between the public telephone network or Public Switched Telephony Network PSTN, and an Internet Service Provider, or ISP.

Access to the Internet is permitted by Internet Service Providers. With the present system of coupling to the Internet, each ISP has a number of arranged PoPs.

Through the public telephone network, indicated as PSTN, an Internet user establishes a connection with a PoP of the desired ISP. Then, from the PoP the traffic is routed to the ISP concerned through a fixed connection.

When the routing is applied as described in the non-prepublished dutch patent application NL-1008259, one PoP per traffic exchange area for each ISP will suffice. Furthermore, then directly at the source it will already be known that it concerns Internet traffic.

Necessarily, the ISP must provide for a covering network of PoPs and further rent fast connections between them and the central server. This is a relatively expensive matter, particularly for smaller ISPs.

The object of the invention is to remove this difficulty and to that end provides for, that a Public Switched Packet Data Network is arranged between a number of PoPs and a number of ISPs in such a way that a signal received by a PoP can be switched through to more than one ISP.

This means that a number of ISP's can use one single PoP, in which the signal led to a PoP will comprise an indication of which ISP the PoP is to be connected to.

Thus, the number of PoPs can be considerably reduced. Said PSPDN can be applied for all or a number of ISPs for providing the routing from a number of PoPs to it.

The PSPDN can be under the responsibility of an Internet Access Operator to be established.

If the network operator of the PSTN has chosen for a routing as described in the previously stated dutch patent application NL-1008259, then the Internet user will have to choose a number consisting of a so-called prefix, indicating that it concerns an Internet call, and a serial number being unique per ISP. He will then be connected to the ISP of his choice through a certain PoP and the PSPDN.

The nature of the connection between PSTN and PoP also depends on the regulations in force. If the PoP is considered as a subscriber connection, then this should be a ISDN connection having DSS1-signalling. DSS1 is understood to mean Digital Subscriber Signalling. If, on the other hand, the PoPs are considered as another network, then the connection should take place in the way standard networks of other operators are connected, as e.g. according to Q.767 or Q.763.

The outgoing router of a PoP will be connected to the PSPDN by at least a 2 Mb link.

A PoP manager can be added to the PoPs described. This is a PC directly adjacent the PoP or at a distance from it, controlling a number of PoPs and performing the following functions:

a) configuration management: management of the tables for conversion of telephone numbers into IP addresses;
b) error management: indicating and recording errors in the connections to the PSTN and to the ISPs;
c) performance management: monitoring the load of the PoPs for timely enhancement of the capacity; and
d) accounting management: recording the use of the PoP itemized per ISP in order to be able to charge the costs in proportion.

The invention is further explained by way of a diagram illustratred in the accompanying figure.

Therein, PSTN - Public Switched Telephony Network - stands forthe public telephone network, PoP stands for a number of Points-of-Presence, PSPDN stands for Public Switched Packet Data Network and ISP 1, 2, 3 indicate some Internet Service Providers.

As illustrated in the diagram, a number of PoPs is coupled to the PSPDN which in turn is coupled to a number of ISPs. A PoP leads signal received from the PSTN to the PSPDN and from there further to the desired ISP. Thus, the signal received by a PoP can not, as is the case up to now, be forwarded to only one single ISP, but to a preselected ISP.

Obviously, the invention also relates to a Public Switched Packet Data Network - PSPDN - capable of connecting a signal received from an arbitrary PoP to one specific ISP.

It will be obvious, that only one possible embodiment of a system according to the invention has been illustrated in the drawing and described above and that many changes can be made without leaving the inventive idea, as it is indicated in the accompanying claims.

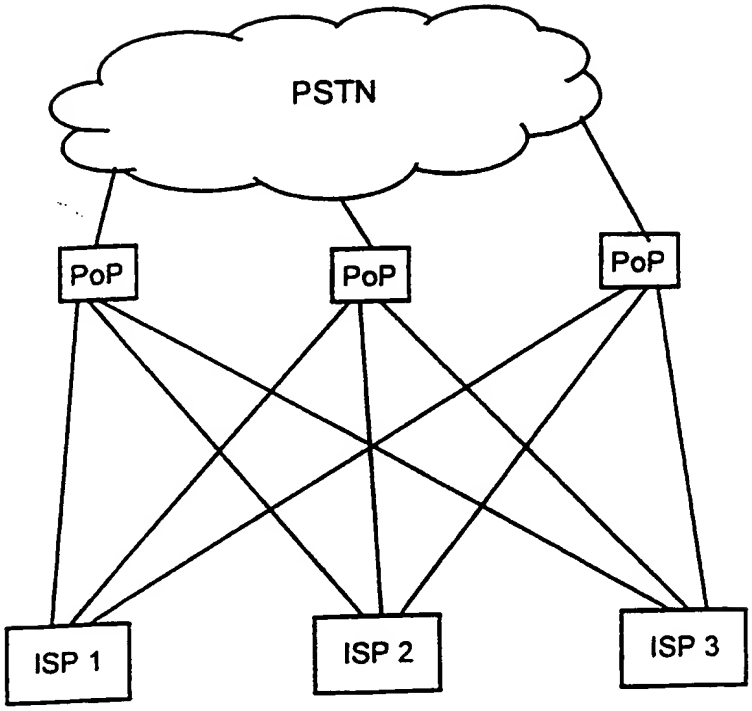
- claims -

C L A I M S

1. System for coupling the public telephone network to the Internet using a number of Points-of-Presence, or PoPs, arranged between the public telephone network, or Public Switched Telephony Network PSTN, and an Internet Service Provider, or ISP, characterized in that a Public Switched Packet Data Network, or PSPDN, is arranged between a number of PoPs and a number of ISPs, in such a way that a signal received by a PoP can be switched through to more than one ISP.

2. System according to claim 1, characterized in that the PoP can be chosen from the public telephone network - PSTN - using various numbers, in which the selected number determines which ISP is contacted through the PSPDN.

3. Public Switched Packet Data Network PSPDN for applying a system according to claim 1 or 2, characterized in that it is executed such, that it is able to switch a signal received from an arbitrary PoP through to one specific ISP.


PSTN
PoP
PoP
PoP
ISP 1
ISP 2
ISP 3

INTERNATIONAL SEARCH REPORT

Int tional Application No
PCT/NL 99/00259

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04M3/00 H04L29/12 H04M3/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04M H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 04088 A (WEBTV NETWORKS INC) 29 January 1998 (1998-01-29) abstract page 6 - page 7 page 25 - page 29 figures 6-8	1-3
X	US 5 621 734 A (MANN BRUCE E ET AL) 15 April 1997 (1997-04-15) column 3, line 21 - column 4, line 5	1

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
4 August 1999	12/08/1999

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/NL 99/00259

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ORLAMUENDER H ET AL: "HANDLING INTERNET TRAFFIC IN TELECOMMUNICATIONS NETWORKS" ISS '97. WORLD TELECOMMUNICATIONS CONGRESS. (INTERNATIONAL SWITCHIN SYMPOSIUM), GLOBAL NETWORK EVOLUTION: CONVERGENCE OR COLLISION? TORONTO, SEPT. 21 - 26, 1997, vol. 1, 21 September 1997 (1997-09-21), pages 579-586, XP000720566 ABE S ET AL the whole document	1-3
A	SCHOEN U ET AL: "CONVERGENCE BETWEEN PUBLIC SWITCHING AND THE INTERNET" IEEE COMMUNICATIONS MAGAZINE, vol. 36, no. 1, January 1988 (1988-01), pages 50-58, 63 - 65, XP000739153 the whole document	1-3
A	MALKIN GARY SCOTT: "DIAL-IN VIRTUAL PRIVATE NETWORKS USING LAYER 3 TUNNELING" PROCEEDINGS OF THE 1997 22ND CONFERENCE ON LOCAL COMPUTER NETWORKS, LCN. MINNEAPOLIS, MN, USA, 2 - 5 November 1997, pages 555-561, XP002084438 the whole document	1-3

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Ir tional Application No
PCT/NL 99/00259

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9804088 A	29-01-1998	US 5862339 A	19-01-1999
		AU 3667197 A	10-02-1998
		EP 0920664 A	09-06-1999
US 5621734 A	15-04-1997	US 5058108 A	15-10-1991
		US 4823122 A	18-04-1989
		US 5734659 A	31-03-1989
		US 4975905 A	04-12-1990
		US 4975904 A	04-12-1990
		AU 633510 B	04-02-1993
		AU 4141689 A	21-12-1989
		AU 633511 B	04-02-1993
		AU 4141789 A	21-12-1989
		AU 591057 B	30-11-1989
		AU 4266185 A	05-12-1985
		BR 8502706 A	12-02-1986
		CA 1257399 A	11-07-1989
		CA 1279933 A	05-02-1991
		CA 1301941 A	26-05-1992
		DE 3584853 A	23-01-1992
		DE 3586430 A	03-09-1992
		DE 3586431 A	03-09-1992
		DE 3586433 A	03-09-1992
		DE 3586434 A	03-09-1992
		DE 3586633 A	15-10-1992
		DE 3586634 A	15-10-1992
		EP 0163577 A	04-12-1985
		EP 0380141 A	01-08-1990
		EP 0374131 A	20-06-1990
		EP 0374132 A	20-06-1990
		EP 0375664 A	27-06-1990
		EP 0374133 A	20-06-1990
		EP 0374134 A	20-06-1990
		FI 852198 A,B,	02-12-1985
		IE 57544 B	07-10-1992
		JP 2515075 B	10-07-1996
		JP 5063706 A	12-03-1993
		JP 1922242 C	07-04-1995
		JP 6048812 B	22-06-1994
		JP 61056538 A	22-03-1986
		JP 2698336 B	19-01-1998
		JP 8214003 A	20-08-1996